

AMENDMENTS

Amendments to the Claims:

The following listing of claims replaces all previous listings or versions thereof:

1-13. (cancelled).

14. (Currently amended) A method for selecting a compound which reduces an activity of
[[a]] an alpha subunit of an SCN3A sodium channel comprising:

- (a) contacting a composition comprising [[a]] an alpha subunit of an SCN3A sodium ion channel protein with [[a]] at least one test compound;
- (b) assaying the activity of alpha subunit of the sodium ion channel in the presence of ~~the~~ said at least one test compound;
- (c) comparing the activity of the alpha subunit of the sodium ion channel in the absence of said at least one test compound;
- (d) selecting a compound which reduces the activity of the alpha subunit of the sodium ion channel as compared to the activity of the alpha subunit of the sodium ion channel in the absence of the at least one test compound;

wherein said alpha subunit of the SCN3A sodium ion channel protein is selected from the group consisting of

- (i) the [[an]] amino acid sequence set forth in SEQ ID NO:67; and
- (ii) [[a]] an SCN3A protein encoded ~~expressed~~ by a full length SCN3A nucleic acid sequence which hybridizes under high stringency conditions ~~having at least 95% identity to the nucleic acid sequence as set forth in SEQ ID NO:65~~ and having a sodium ion channel activity, wherein said high stringency conditions comprise a hybridization at 65°C in 5 x SSC, 5 x Denhardt's solutions, 1% SDS, and 100 µg/ml denatured salmon sperm DNA; and

wherein said alpha subunit of the SCN3A sodium ion channel, when mutated, can lead to idiopathic generalized epilepsy.

Claims 15-33 (cancelled).

34. (Currently amended) The method of claim 14, wherein said SCN3A alpha subunit protein is as set forth in SEQ ID NO:67, with amino acid residue 43 being deleted or amino acid residue 1035 being an isoleucine instead of a valine,~~the method is used for selecting a compound capable of reducing voltage-gated ion channel activity of a human SCN3A protein associated with idiopathic generalized epilepsy (IGE).~~
35. (Currently amended) The method of claim 14, wherein ~~the~~ said method is used for selecting a compound capable of reducing voltage-gated ion channel activity ~~of a human SCN3A protein associated with generalized epilepsy with febrile seizures.~~
36. (Currently amended) The method of claim 14, wherein ~~the~~ said at least one test compound is a library of test compounds.
37. (Currently amended) The method of claim 14, wherein ~~the~~ said SCN3A nucleic acid encoding ~~the~~ said SCN3A protein is comprised in an expression vector.
38. (Currently amended) The method of claim 37, wherein ~~the~~ said expression vector is comprised in a cell.
39. (Currently amended) The method of claim 14, wherein ~~the~~ said assaying is performed with a whole cell.
40. (Currently amended) The method of claim 14, wherein ~~the~~ said sodium ion channel activity is:
- (i) voltage dependence activation;
 - (ii) voltage dependence of steady state level of inactivation;
 - (iii) time course of inactivation;
 - (iv) the number or fraction of channels available for opening;
 - (v) change in current;
 - (vi) flux of ions through the channel;

- (vii) phosphorylation of channel;
 - (viii) binding of molecules to the channel; or
 - (ix) induction of a second cellular messenger.
41. (Currently amended) The method of claim 40, wherein ~~the~~ said flux of ions through the channel is assessed by:
- (i) fluorescence resonance energy transfer (FRET)-based voltage sensor assay;
 - (ii) dibasic dyes;
 - (iii) ¹⁴C-guanidine;
 - (iv) two electrode voltage clamp; or
 - (v) patch-clamp.
42. (Currently amended) The method of claim 40, wherein ~~the~~ said binding of molecules through the channel is assessed by surface plasmon resonance.
43. (Currently amended) The method of claim 14, wherein ~~the~~ said method is used for selecting a compound which reduces the hyperexcitability state of ~~[[a]]~~ an SCN3A ion channel.
44. (Currently amended) The method of claim 14, wherein SEQ ID NO. 67 is ~~encoded~~ obtained from an SCN3A nucleic acid sequence encoding SEQ IS NO: 67 by a nucleic acid.
- 45.-47. (Cancelled)
48. (New) The method of claim 34, wherein said method is used for selecting a compound capable of reducing voltage-gated ion channel activity.
49. (New) The methods of claim 48, wherein said at least one test compound is a library of test compounds.

50. (New) The method of claim 49, wherein said SCN3A alpha subunit protein is as set forth in SEQ ID NO:67, with amino acid residue 43 being deleted.
51. (New) The method of claim 49, wherein said SCN3A alpha subunit protein is as set forth in SEQ ID NO:67, with amino acid residue 1035 being an isoleucine instead of a valine.